WATER PRESSURE
Teaching Guidelines

Subject: Mathematics

Topics: Algebra—Coordinate Systems; Patterns, Relations and Functions; Linear Equations and Functions

Grades: 6 - 12

Knowledge and Skills:

- Can plot a point in a two-dimensional coordinate system, given the coordinates, or determine the coordinates of a given point
- Can relate aspects of a graphical model to the real world situation which is being modeled
- Can determine the equation of a linear function that closely matches a set of points

Materials: (for each team)

- empty milk container (half gallon, gallon, or quart
- cake pan
- sheet of waxed paper
- ruler

Procedure: The activity is best done by students working in teams of two or three members.

Distribute the handout and make sure all teams understand the task, before they begin. You may wish to discuss the variables, and which is independent and which is dependent, with the entire class before students begin the investigation.

The data graphs should be linear, and you should have students determine the equations if they have previously learned how to do so.

Water Pressure

Investigation

Instructions

You can use a half gallon milk carton or gallon milk container for this investigation.

1. Rinse out the container, and cut off the top. Use the tip of your pencil or pen to poke a small hole in it, about 3 inches from the bottom.
2. Arrange your experiment as shown in the diagram, so that water which comes out of the hole falls into a cake pan or similar container.
3. Fill the container with water while keeping your finger over the hole. Measure the distance from the top of the water to the hole, and record it. Remove your finger to allow water to flow, and measure the distance the stream of water travels before it hits the bottom of the cake pan.
4. After the water has dropped one inch, make both measurements again. Continue until there is not enough pressure to force the water into a stream as it comes out of the hole.
5. What are the variables of this experiment?

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   _____
6. Which is independent and which is dependent?

   _____

   _____
7. Graph your data, and sketch a line or curve that smoothly connects the points on your graph.
8. Find an equation that creates a line which closely matches your data.